

کالیسیس

$$\begin{array}{r} 3x^3 - 2x^2 + 31x - 10 \mid x^2 - 24x + 140 \\ - 3x^3 + 14x^2 \\ \hline 14x^2 - 24x + 140 \end{array}$$

$$D = R - \{x^2 - 24x + 140\}$$

$$\begin{array}{r} - 24x^2 + 24x - 10 \\ + 14x^2 - 140 \\ \hline - 10x^2 + 24x - 150 \\ - 10x^2 + 24x - 150 \\ \hline 0 \end{array}$$

الف) $\frac{x+1}{3x^3 - 2x^2 + 31x - 10}$

ب) $\frac{x+3}{3x^3 - x^2 - 11x - 6}$

$$\begin{array}{r} 3x^3 - x^2 - 11x - 6 \mid x+3 \\ - 3x^3 + 9x^2 \\ \hline - 10x^2 - 11x - 6 \\ + 10x^2 - 30x - 18 \\ \hline - 41x - 24 \\ + 41x + 114 \\ \hline 90 \end{array}$$

$$D = R - \{3x^2 - 10x - 21\}$$

الف) $1 = \sqrt{3 - 2x} \Rightarrow 1 = \sqrt{1} \Rightarrow 1 = 1 \Rightarrow x = 1$

ب) $D = \{x \mid x \leq \frac{3}{2}, x \neq 1\}$ $D = (-\infty, 1) \cup (1, \frac{3}{2}]$

الف) $\frac{x+1}{x - \sqrt{3-2x}} = x - \sqrt{3-2x} \neq 0 \Rightarrow x \neq \sqrt{3-2x}$
 $x \in (-\infty, \frac{3}{4}]$

$x^2 = 3 - 2x \Rightarrow x^2 + 2x - 3 = 0 \Rightarrow (x+3)(x-1)$

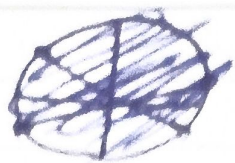
ب) $\frac{x+3}{x - \sqrt{3-2x}} = 3x - 2 \Rightarrow 3x \geq 2 \Rightarrow x \geq \frac{2}{3}$

$x^2 - 2x - 2 \Rightarrow x^2 - 2x + 2 = 0$ $x - \sqrt{3-2x} \neq 0 \Rightarrow x \neq \sqrt{3-2x}$

• $\frac{2}{x-1} - 2 \Rightarrow 2 = \sqrt{4-2x} \Rightarrow 2 = 2 \Rightarrow x = 2$

$D = \{x \mid x \leq \frac{3}{2}, x \neq 1, x \neq 2\}$

مسئله سوم



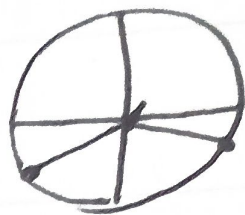
الف $\frac{\sin \alpha}{r \cos \alpha - 1}$

$r \cos \alpha - 1 \neq 0$
 $r \cos \alpha \neq 1$
 $\cos \alpha \neq \frac{1}{r}$



ب $\frac{r \cos \alpha + 1}{r \sin \alpha + 1}$

$r \sin \alpha + 1 \neq 0$
 $\sin \alpha \neq -\frac{1}{r}$



ر.ا.
ر.ب.

$D = R - \left\{ \alpha, \pi + \frac{\pi}{4}, \pi - \frac{\pi}{4} \right\}$

ج $\frac{\tan \alpha + r}{\cot \alpha - 1}$
 $\frac{\cos \alpha}{\sin \alpha}$

$\cot \alpha - 1 \neq 0$
 $\cot \alpha \neq 1$



$D = R - \left\{ \alpha, \pi + \frac{\pi}{4} \right\}$

د $\frac{\sin \alpha + 1}{r \sin^2 \alpha - r}$



$D = R - \left\{ \alpha, \pi + \frac{\pi}{4}, \pi - \frac{\pi}{4} \right\}$

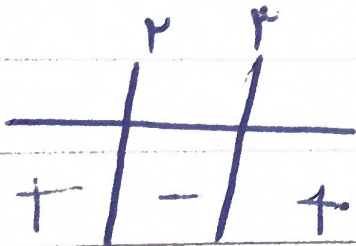
$r \sin^2 \alpha - r \neq 0$

$\sin^2 \alpha \neq \frac{r}{r} \Rightarrow \sin \alpha \neq \sqrt{\frac{r}{r}}$

مسئله چهارم

الف $x^2 - \omega x + 4 > 0$

$(x - 2)(x - 3) > 0$

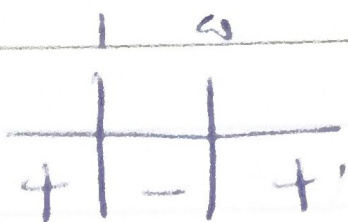


$(-\infty, 2] \cup [3, +\infty)$

$[3, +\infty)$

$$b) x^2 - 4x + \omega < 0$$

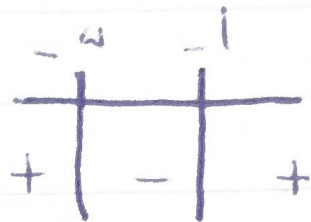
$$(x-1)(x-\omega) < 0$$



$$(1, \omega)$$

$$c) x^2 + 4x + \omega > 0$$

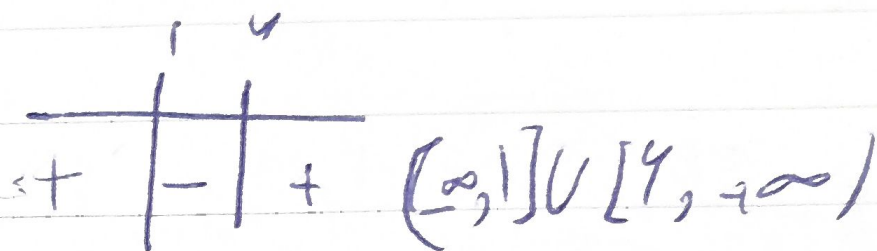
$$(x+1)(x+\omega) > 0$$



$$[-1, +\infty)$$

$$d) x^2 - 4x + 4 < 0$$

$$(x-1)(x-4) < 0$$



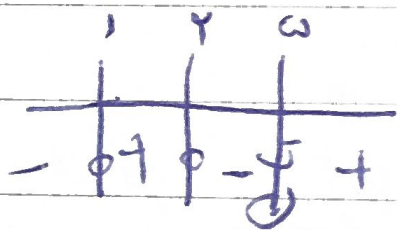
$$(\infty, 1] \cup [4, +\infty)$$

سوال بنفیس

$$الف) \frac{x^2 - 3x + 2}{x - \omega} < 0$$

$$(-\infty, 1] \cup (2, \omega) \cup [\omega, +\infty)$$

$$\frac{(x-1)(x-2)}{(x-\omega)}$$

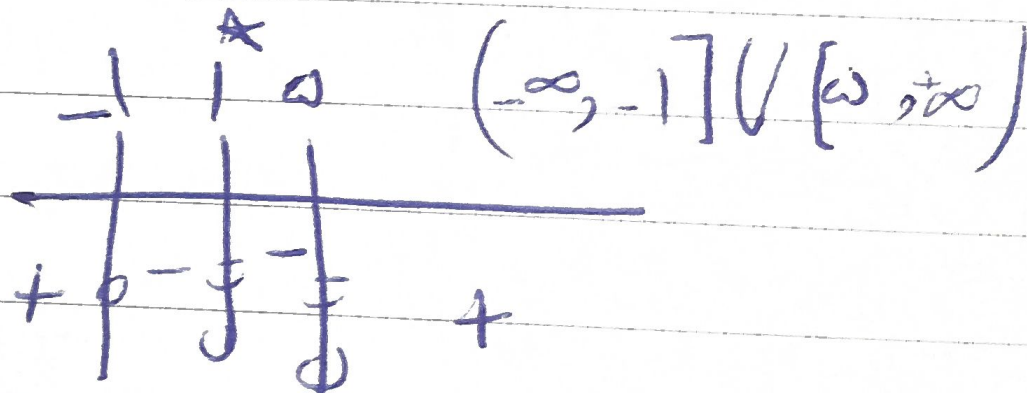


⇓

$$x \in \{1, 2\} \cup (\omega, \infty)$$

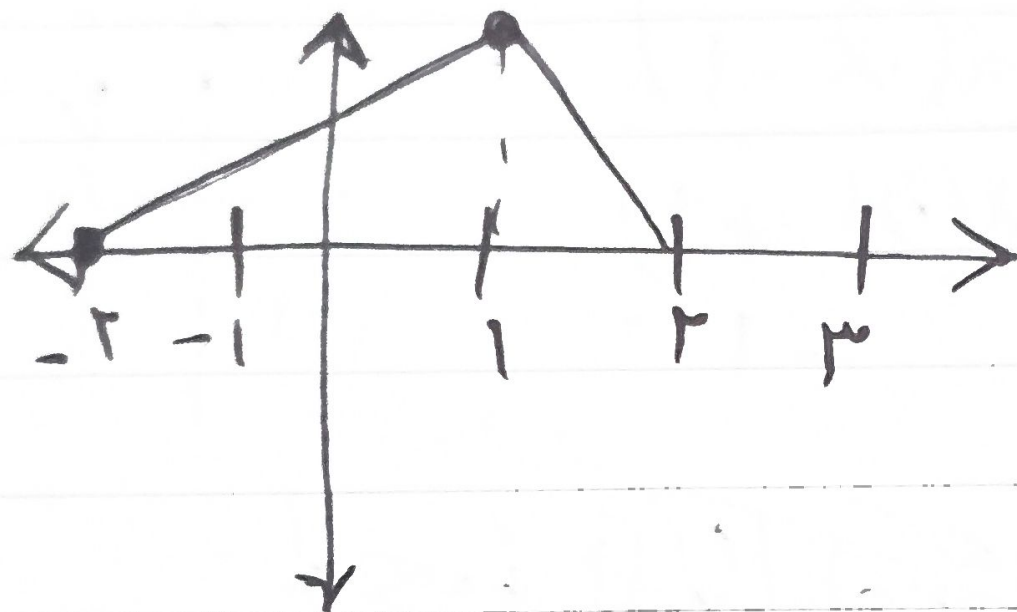
$$ب) \frac{x^2 - 1}{x^2 - 4x + \omega} > 0$$

$$\frac{(x-1)(x+1)}{(x-1)(x-\omega)}$$

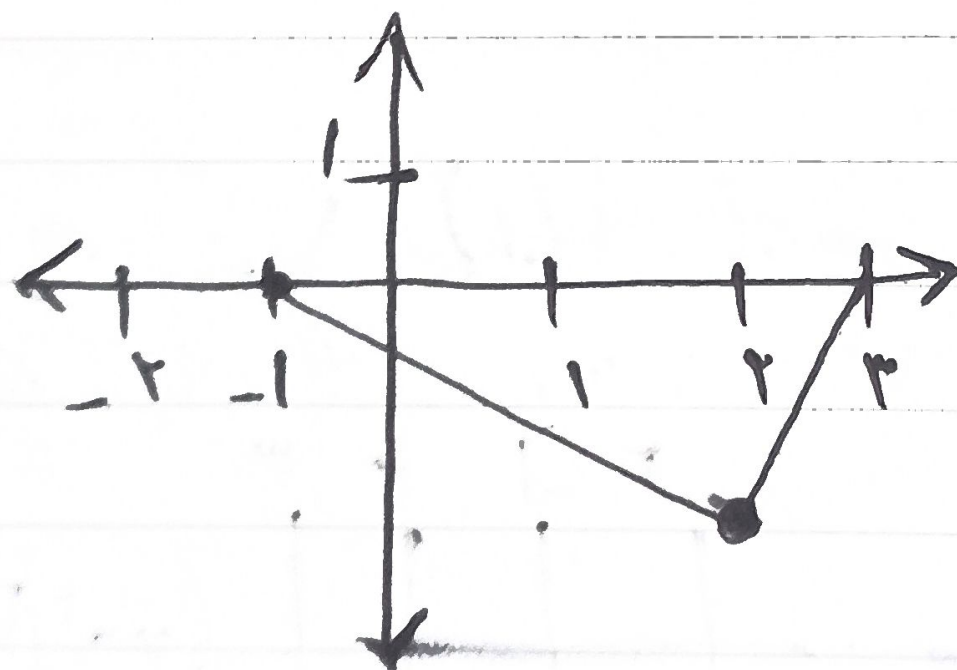


$$(-\infty, -1] \cup [\omega, +\infty)$$

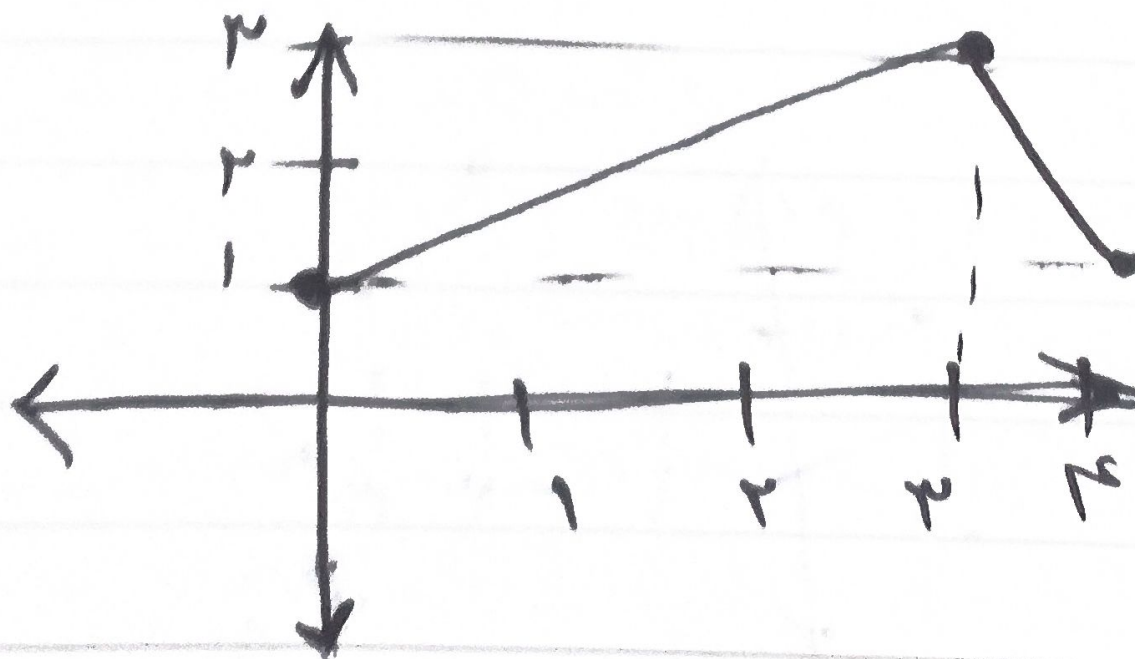
ب



ج



د



الاجابة

	-	0	1	
$(A^T - a)$	+	+	-	+
$A^T + A$	+	-	+	+
	+	-	-	+

مثال ششم

$$الف) y = \sqrt{\frac{x^2 - 5x + 3}{x^2 - 1}}$$

$$[3, +\infty)$$

$$\frac{x^2 - 5x + 3}{x^2 - 1} \geq 0 \rightarrow \frac{(x-1)(x-3)}{x^2 - 1}$$



$$ب) y = \sqrt[3]{\frac{x^2 - 5x + 3}{x^2 - 1}}$$

$$Df = \mathbb{R} - \{1, -1\}$$

$$x^2 - 1 \neq 0 \rightarrow (x-1)(x+1) \neq 0$$



مثال هفتم

$$الف) y = \log(x^2 - 3x) \quad \underline{Df} \quad x(x-3) > 0 \quad (-\infty, 0) \cup (3, +\infty)$$

$$ب) y = \log \frac{14 - x^2}{|x| - 2}$$

$$14 - x^2 > 0 \rightarrow -x^2 > -14 \rightarrow x^2 < 14 \rightarrow x < \sqrt{14}$$

$$|x| - 2 > 0 \rightarrow |x| > 2 \quad D = (\sqrt{14}) - \{2\}$$

$$|x| - 2 \neq 1 \rightarrow |x| \neq 3$$

$$ج) y = \log \frac{x^2 - \sqrt{x+12}}{x-3}$$

$$= \log \frac{(x-3)(x-3)}{(x-3)} \Rightarrow x-3 > 0 \Rightarrow x > 3$$

$$1 - x \neq 1$$

$$-x \neq 0 \Rightarrow x \neq 0$$

$$1 - x > 0 \rightarrow x < 1 \quad D = (1, 0) - \{0\}$$